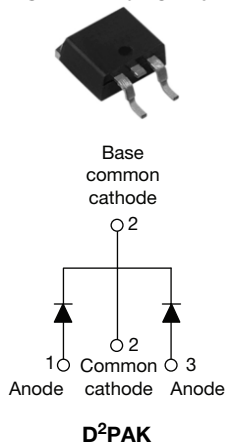
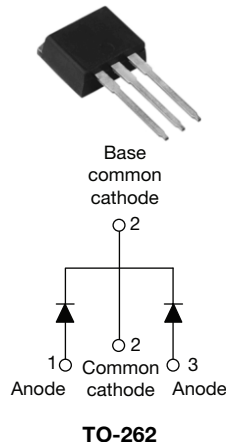


Schottky Rectifier, 2 x 10 A

VS-MBRB20...CTPbF



VS-MBR20 ...CT-1PbF



FEATURES

- 150 °C T_J operation
- Low forward voltage drop
- High frequency operation
- Center tap D²PAK and TO-262 packages
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Halogen-free according to IEC 61249-2-21 definition
- Compliant to RoHS directive 2002/95/EC
- AEC-Q101 qualified



RoHS
COMPLIANT
HALOGEN
FREE

DESCRIPTION

This center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

PRODUCT SUMMARY

$I_{F(AV)}$	2 x 10 A
V_R	80 V to 100 V

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform (per device)	20	A
I_{FRM}	$T_C = 133\text{ °C}$ (per leg)	20	
V_{RRM}		80 to 100	V
I_{FSM}	$t_p = 5\text{ }\mu\text{s}$ sine	850	A
V_F	10 Apk, $T_J = 125\text{ °C}$	0.70	V
T_J	Range	- 65 to 150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-MBRB2080CTPbF VS-MBR2080CT-1PbF	VS-MBRB2090CTPbF VS-MBR2090CT-1PbF	VS-MBRB20100CTPbF VS-MBR20100CT-1PbF	UNITS
Maximum DC reverse voltage	V_R	80	90	100	V
Maximum working peak reverse voltage	V_{RWM}				

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 133\text{ °C}$, rated V_R		10	A
				20	
Peak repetitive forward current per leg	I_{FRM}	Rated V_R , square wave, 20 kHz, $T_C = 133\text{ °C}$		20	
Non-repetitive peak surge current	I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	850	
		Surge applied at rated load conditions halfwave, single phase, 60 Hz		150	
Peak repetitive reverse surge current	I_{RRM}	2.0 μs , 1.0 kHz		0.5	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25\text{ °C}$, $I_{AS} = 2\text{ A}$, $L = 12\text{ mH}$		24	mJ

VS-MBRB20...CTPbF, VS-MBR20...CT-1PbF Series



Vishay High Power Products Schottky Rectifier, 2 x 10 A

ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop	$V_{FM}^{(1)}$	10 A	$T_J = 25\text{ }^{\circ}\text{C}$	0.80	V	
		20 A		0.95		
		10 A	$T_J = 125\text{ }^{\circ}\text{C}$	0.70		0.85
		20 A				
Maximum instantaneous reverse current	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	Rated DC voltage	0.10	mA	
		$T_J = 125\text{ }^{\circ}\text{C}$		6		
Threshold voltage	$V_{F(TO)}$	$T_J = T_J$ maximum		0.433	V	
Forward slope resistance	r_t			15.8	mΩ	
Maximum junction capacitance	C_T	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^{\circ}\text{C}$		400	pF	
Typical series inductance	L_S	Measured from top of terminal to mounting plane		8.0	nH	
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	V/μs	

Note

(1) Pulse width < 300 μ s, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range		T _J		- 65 to 150	°C
Maximum storage temperature range		T _{Stg}		- 65 to 175	
Maximum thermal resistance, junction to case per leg		R _{thJC}	DC operation	2.0	°C/W
Typical thermal resistance, case to heatsink		R _{thCS}	Mounting surface, smooth and greased	0.50	
Maximum thermal resistance, junction to ambient		R _{thJA}	DC operation	50	
Approximate weight				2	g
				0.07	oz.
Mounting torque	minimum		Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device		Case style D ² PAK		MBRB20100CT	
		Case style TO-262		MBR20100CT-1	



VS-MBRB20...CTPbF, VS-MBR20...CT-1PbF Series

Schottky Rectifier, 2 x 10 A Vishay High Power Products

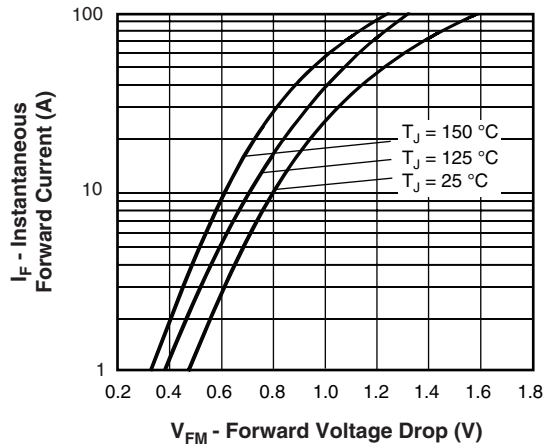


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

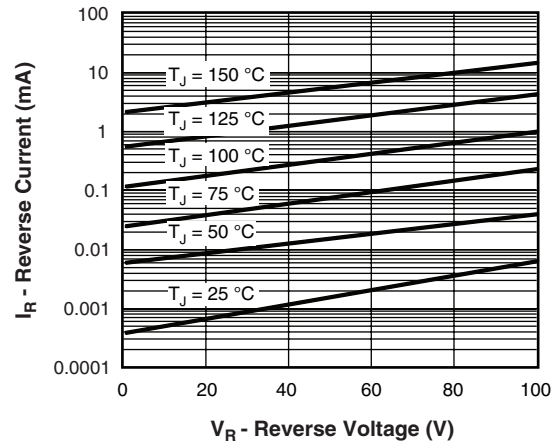


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

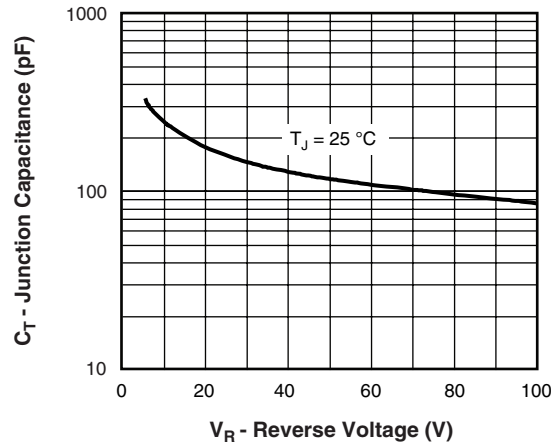


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

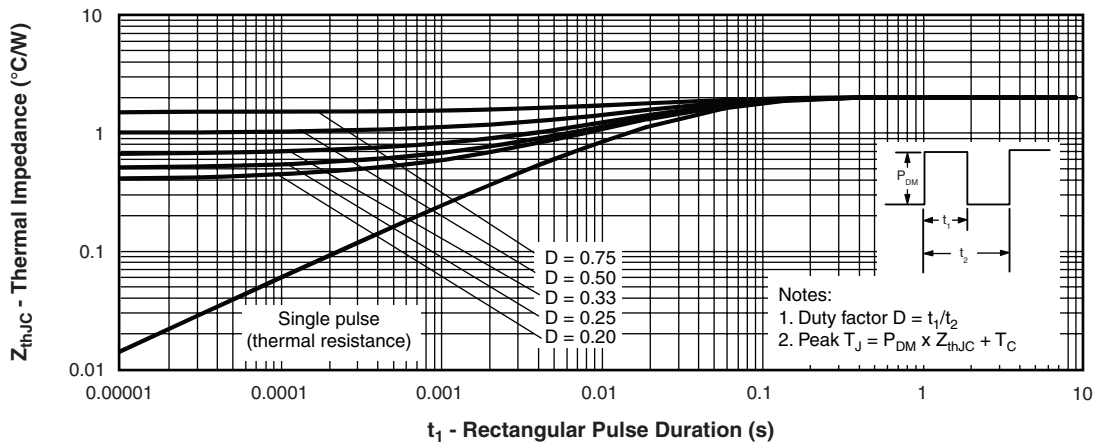


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

VS-MBRB20...CTPbF, VS-MBR20...CT-1PbF Series

Vishay High Power Products Schottky Rectifier, 2 x 10 A

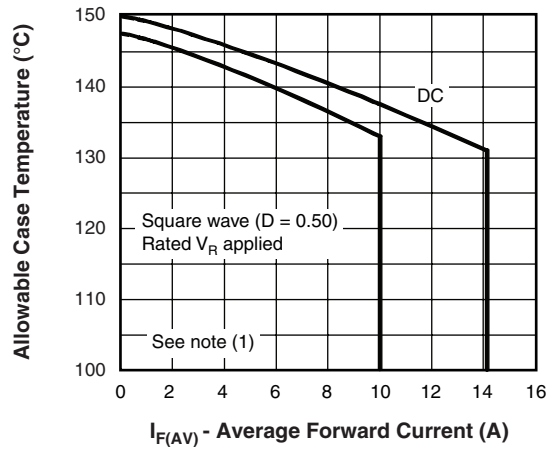


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

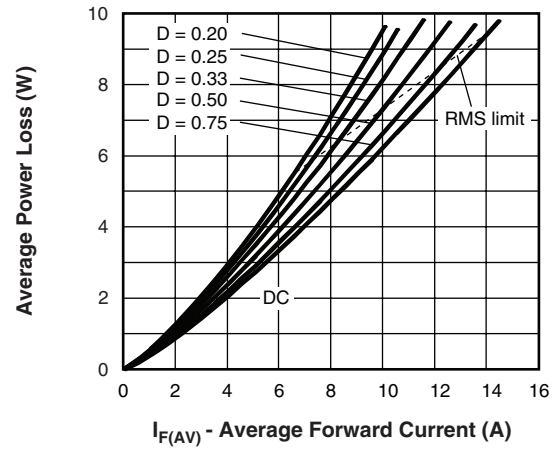


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

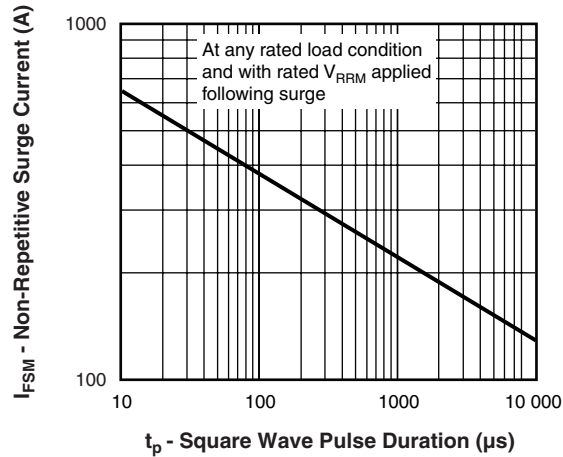


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 $P_{d_{REV}}$ = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = Rated V_R



VS-MBRB20...CTPbF, VS-MBR20...CT-1PbF Series

Schottky Rectifier, 2 x 10 A Vishay High Power Products

ORDERING INFORMATION TABLE

Device code	VS-	MBR	B	20	100	CT	-1	TRL	P
	1	2	3	4	5	6	7	8	9

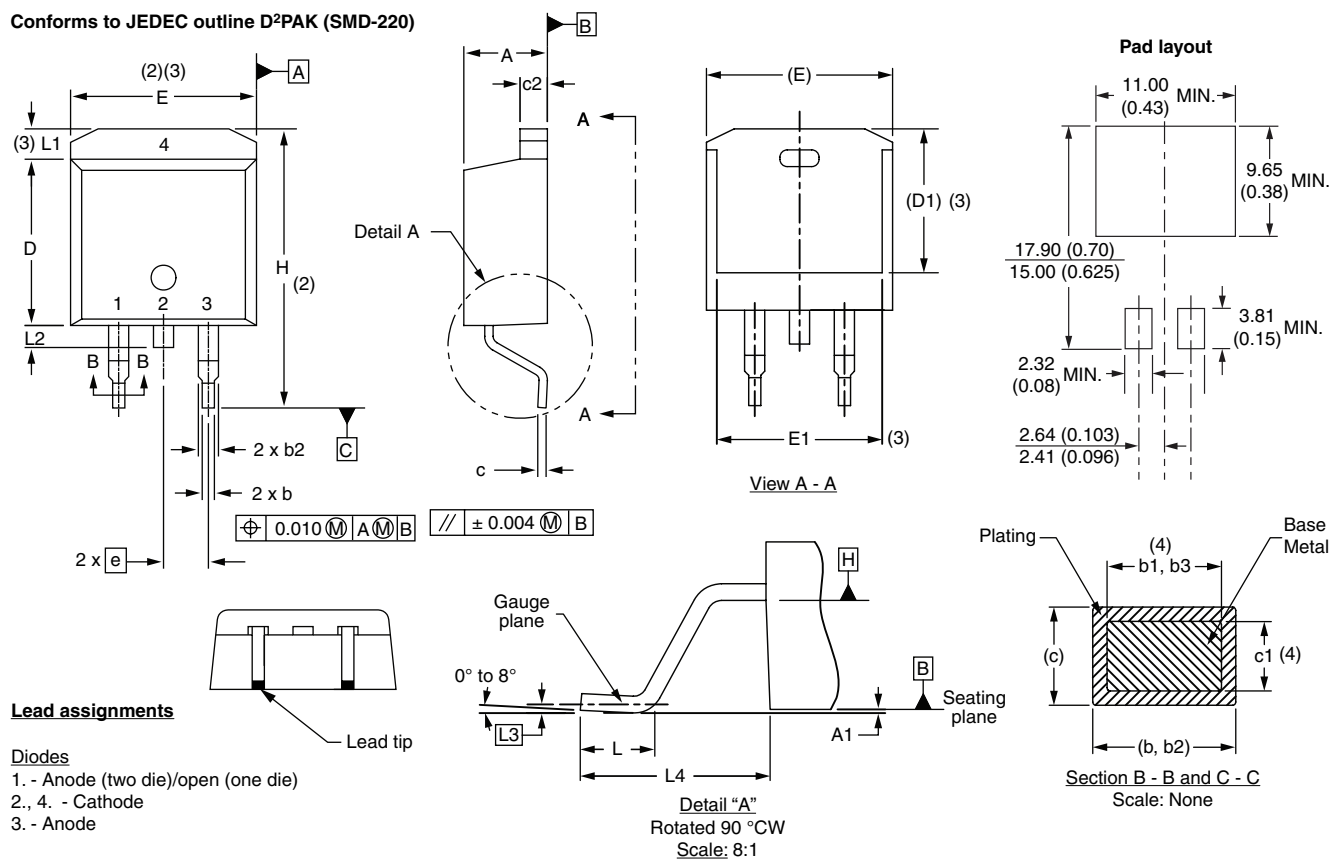
- | | | | | | | |
|-------------|---|--|---|-----------|-----------|-------------|
| 1 | - | HPP product suffix | | | | |
| 2 | - | Essential part number | | | | |
| 3 | - | • B = D ² PAK 7 = None | | | | |
| | | • None = TO-262 7 = -1 | | | | |
| 4 | - | Current rating (20 = 20 A) | <table border="1"><tr><td>80 = 80 V</td></tr><tr><td>90 = 90 V</td></tr><tr><td>100 = 100 V</td></tr></table> | 80 = 80 V | 90 = 90 V | 100 = 100 V |
| 80 = 80 V | | | | | | |
| 90 = 90 V | | | | | | |
| 100 = 100 V | | | | | | |
| 5 | - | Voltage ratings | | | | |
| 6 | - | CT = Essential part number | | | | |
| 7 | - | • None = D ² PAK 3 = B | | | | |
| | | • -1 = TO-262 3 = None | | | | |
| 8 | - | • None = Tube (50 pieces) | | | | |
| | | • TRL = Tape and reel (left oriented - for D ² PAK only) | | | | |
| | | • TRR = Tape and reel (right oriented - for D ² PAK only) | | | | |
| 9 | - | • PbF = Lead (Pb)-free (for TO-262 and D ² PAK tube) | | | | |
| | | • P = Lead (Pb)-free (for D ² PAK TRR and TRL) | | | | |

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95014
Part marking information	www.vishay.com/doc?95008
Packaging information	www.vishay.com/doc?95032

D²PAK, TO-262

DIMENSIONS FOR D²PAK in millimeters and inches

Conforms to JEDEC outline D²PAK (SMD-220)



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190	
A1	0.00	0.254	0.000	0.010	
b	0.51	0.99	0.020	0.039	
b1	0.51	0.89	0.020	0.035	4
b2	1.14	1.78	0.045	0.070	
b3	1.14	1.73	0.045	0.068	4
c	0.38	0.74	0.015	0.029	
c1	0.38	0.58	0.015	0.023	4
c2	1.14	1.65	0.045	0.065	
D	8.51	9.65	0.335	0.380	2

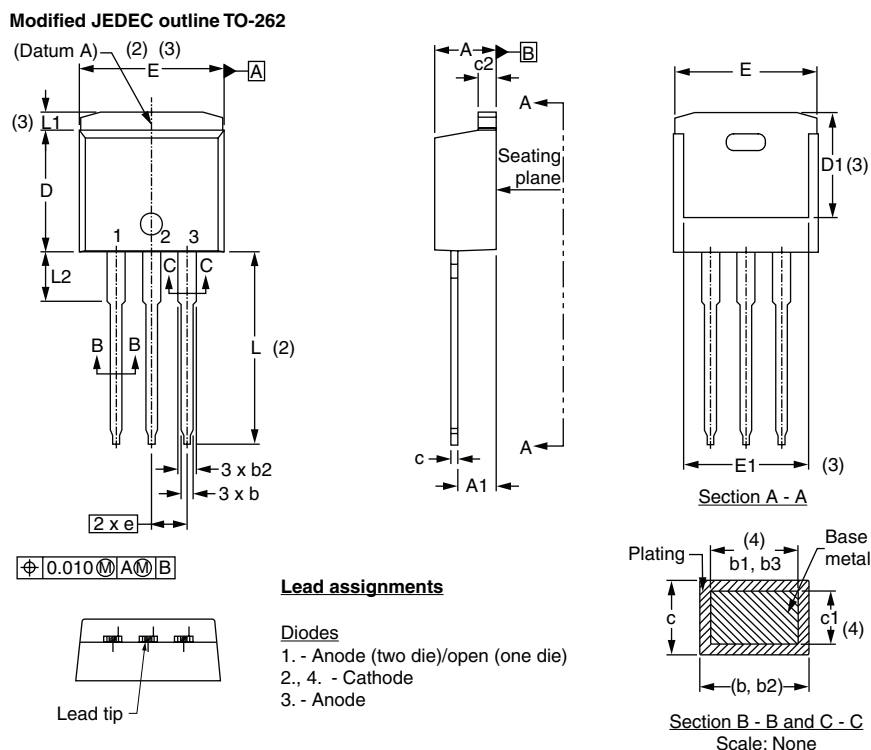
SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
D1	6.86	8.00	0.270	0.315	3
E	9.65	10.67	0.380	0.420	2, 3
E1	7.90	8.80	0.311	0.346	3
e	2.54 BSC		0.100 BSC		
H	14.61	15.88	0.575	0.625	
L	1.78	2.79	0.070	0.110	
L1	-	1.65	-	0.066	3
L2	1.27	1.78	0.050	0.070	
L3	0.25 BSC		0.010 BSC		
L4	4.78	5.28	0.188	0.208	

Notes

- (1) Dimensioning and tolerancing per ASME Y14.5 M-1994
- (2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Datum A and B to be determined at datum plane H
- (6) Controlling dimension: inch

- (7) Outline conforms to JEDEC outline TO-263AB

DIMENSIONS FOR TO-262 in millimeters and inches



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190	
A1	2.03	3.02	0.080	0.119	
b	0.51	0.99	0.020	0.039	
b1	0.51	0.89	0.020	0.035	4
b2	1.14	1.78	0.045	0.070	
b3	1.14	1.73	0.045	0.068	4
c	0.38	0.74	0.015	0.029	
c1	0.38	0.58	0.015	0.023	4
c2	1.14	1.65	0.045	0.065	
D	8.51	9.65	0.335	0.380	2
D1	6.86	8.00	0.270	0.315	3
E	9.65	10.67	0.380	0.420	2, 3
E1	7.90	8.80	0.311	0.346	3
e	2.54 BSC		0.100 BSC		
L	13.46	14.10	0.530	0.555	
L1	-	1.65	-	0.065	3
L2	3.56	3.71	0.140	0.146	

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Controlling dimension: inches

- (6) Outline conform to JEDEC TO-262 except A1 (maximum), b (minimum) and D1 (minimum) where dimensions derived the actual package outline



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